Saint-Raymond and Scholze Awarded 2015 Fermat Prizes

Laure Saint-Raymond of École Normale Supérieure and Peter Scholze of the University of Bonn have been awarded Fermat Prizes for 2015. Laure Saint-Raymond was honored for her development of asymptotic theories of partial differential equations, including the fluid limits of rarefied flows, multiscale analysis in plasma physics equations and ocean modeling, and the derivation of the Boltzmann equation from interacting particle systems. Laure shared with the Notices her conviction “that research is not a matter of competition but rather a collective challenge…. I like the ‘algorithm for discovery’ published by [David] Paydarfar and [William] Schwartz in Science (April 2001): Slow down to explore... Read but not too much... Pursue quality for its own sake... Cultivate smart friends.”

Peter Scholze was honored for his invention of perfectoid spaces and their application to fundamental problems in algebraic geometry and in the theory of automorphic forms. (See “What is a perfectoid space?” by Bhargav Bhatt in Notices, October 2014.)

The Fermat Prize is given every two years for research in fields in which Pierre de Fermat made major contributions: statements of variational principles, foundations of probability and analytic geometry, and number theory. The prize carries a cash value of 20,000 euros (approximately US$22,000).

—From a Fermat Prize announcement

ICMI Klein and Freudenthal Medals Awarded

Alan J. Bishop of Monash University has been awarded the 2015 Felix Klein Medal of the International Commission on Mathematical Instruction (ICMI) “in recognition of his more than forty-five years of sustained, consistent, and outstanding lifetime achievements in mathematics education research and scholarly development”. The prize citation states that “his book Mathematical Enculturation: A Cultural Perspective on Mathematics Education, published in 1988, was groundbreaking in that it developed a new conception of mathematics—the notion of mathematics as a cultural product and the cultural values that mathematics embodies.... Bishop has been instrumental in bringing the political, social, and cultural dimensions of mathematics education to the attention of the field.” He has done extensive mentoring work with teachers and developed full-time MEd and PhD programs in mathematics education while at Cambridge University. As the citation states, “few researchers can match the way in which his research has improved mathematics education through the connections he has forged between research and practice.” Bishop told the Notices: “When
leaving school I had to make a choice between studying mathematics or music. I played bassoon in the National Youth Orchestra [of Great Britain] at that time, and there was no possibility of a joint degree between the two. I chose to study mathematics but have always enjoyed music. I still play the bassoon as well as other instruments. Is this an example of the famous links between mathematical and musical abilities?”

JILL ADLER of the University of the Witwatersrand has been awarded the Hans Freudenthal Medal for 2015 “in recognition of her outstanding research program dedicated to improving the teaching and learning of mathematics in South Africa—from her 1990s groundbreaking sociocultural research on the inherent dilemmas of teaching mathematics in multilingual classrooms through to her subsequent focus on problems related to mathematical knowledge for teaching and mathematics teacher professional development.” According to the citation, “she has played an outstanding leadership role in growing mathematics education research in South Africa, Africa, and beyond. Her development of research teams involving graduate students and postdoctoral fellows, along with the mentoring of numerous PhD and master’s students, have all added to the human research capacity she has been instrumental in creating in Southern Africa.”

The Klein Medal honors lifetime achievement in mathematics education research. The Freudenthal Medal recognizes a major cumulative program of research.

—From ICMI announcements

IEEE Control Systems Award Given

The Institute of Electrical and Electronics Engineers (IEEE) awards the Control Systems Award annually. The recipient of the 2016 award is ARTHUR J. KRENER of the Naval Postgraduate School, Monterey, California, “for contributions to the analysis, control, and estimation of nonlinear control systems.” The award recognizes an individual’s “outstanding contributions to control systems engineering, science, or technology” and considers the seminal nature, depth, and breadth of contributions, as well as singular achievement and practical impact.

—From an IEEE announcement

Prizes of the Mathematical Society of Japan

The Mathematical Society of Japan (MSJ) has awarded the following prizes for 2015.

The 2015 Autumn Prize was awarded to KOJI FUJIIWARA of Kyoto University for outstanding contributions to work on constructing group actions on quasi-trees.

The 2015 Analysis Prizes were awarded to MITSURO SUGIMOTO of Nagoya University for research on harmonic analysis for modulation and related spaces and smoothing estimates for partial differential equations of dispersive type; to KAZUNAGA TANAKA of Waseda University for work on variational methods for multicluster solutions to a singular perturbation of nonlinear elliptic equations; and to AKIMICHI TAKEMURA of the University of Tokyo for studies on holonomic gradient method.

The 2015 Geometry Prizes were awarded to HIROSHI IRITANI of Kyoto University for the study of quantum cohomology and to OSAMU SAeki of Kyushu University for research on stable maps and topology of manifolds. The 2015 Takebe Katahiro Prizes were awarded to Michiaki Onodera of Kyushu University for the study of shapes of solutions of elliptic equations by the evolution equation approach; to SHOUEI HONDA of Tohoku University for research in geometric analysis on limit spaces of Riemannian manifolds; and to SHUNSUKE TAMANO of Kyoto University for work on automorphic L-functions and theta correspondence.

The 2015 Takebe Katahiro Prizes for Encouragement of Young Researchers were awarded to MASAHIRO IKEDA of Kyoto University for research on the asymptotic behavior of solutions for nonlinear dispersive wave equations; to ERIKA USHIKOSHI of Tamagawa University for work on the Hadamard variational formula of the Stokes equations; to MOTOHIRO SOBAJIMA of the Tokyo University of Science for the study of second-order elliptic operators with un-
bounded coefficients; and to KAZUKI MORIMOTO of Kyoto University for research on periods of automorphic forms and special values of $L$-functions.

—From MSJ announcements

Prizes of the New Zealand Mathematical Society

The New Zealand Mathematical Society (NZMS) has announced several awards for 2015.

HINKE OSINGA of the University of Auckland received the NZMS Research Award “for pioneering work on theory and computational methods in dynamical systems and its applications in biology and engineering”.

ADAM DAY of Victoria University of Wellington received the NZMS Early Career Award “for fundamental contributions to the theory of algorithmic randomness and computability, including the solution of the random covering problem”.

ANDREW KEANE of the University of Auckland was awarded the Aitken Prize for the best contributed talk by a student at the NZMS Colloquium for “Bifurcation analysis of a model for the El Niño Southern Oscillation”.

ANDRUS GIRAŁDO of the University of Auckland received the 2015 Australia and New Zealand Industrial and Applied Mathematics (ANZIAM) poster prize for best poster by an early career researcher at the NZMS Colloquium for his poster “To Flip or Not to Flip”.

Three mathematicians were chosen as Fellows of the New Zealand Mathematical Society:  
• STEVEN GALBRAITH, University of Auckland  
• MICK ROBERTS, Massey University  
• CHARLES SEMPLE, University of Canterbury.

—From an NZMS announcement

AAAS Fellows Chosen

The following mathematical scientists have been elected fellows of the Section on Mathematics of the American Association for the Advancement of Science (AAAS):

• DANIEL L. GOROFF, Alfred P. Sloan Foundation  
• PETER KUCHMENT, Texas A&M University  
• REINHARD C. LAUBENBACHER, University of Connecticut Health Center/Jackson Laboratory for Genomic Medicine  
• HOWARD A. LEVINE, Iowa State University.

—From an AAAS announcement

Lesley Sibner (1934–2013)

Lesley Sibner died unexpectedly on September 11, 2013. Sibner first pursued a career in acting, studying at the School of Drama at the Carnegie Institute of Technology (now known as Carnegie-Mellon University) and then with Uta Hagen in New York. She returned to college and fell in love with mathematics while taking a required calculus course. She also fell in love with her physics instructor, Robert Sibner, who became her husband and collaborator. Sibner received her PhD from the Courant Institute under the direction of Lipman Bers and Cathleen Morawetz. After a position at Stanford University, she spent most of her career as a professor at Polytechnic Institute of Brooklyn (now known as the New York University Polytechnic School of Engineering). She held visiting positions at the Institute for Advanced Study in Princeton, at Harvard University, at the Institut des Hautes Études Scientifiques in Bures-sur-Yvette, at the Max Planck Institute in Bonn, and at the Institut de Mathématiques de Jussieu in Paris. She was a Fulbright Research Scholar at the Institut Henri Poincaré and a Bunting Scholar at the Radcliffe Institute. Sibner was the associate secretary of the AMS for the Eastern Section from 1993 to 2009. She was in the inaugural class of Fellows of the AMS.

Sibner’s initial research was on fluid flow and mixed-type PDEs such as the Tricomi equation. Soon afterward, Lesley and her husband Bob began a lifelong collaboration
in global analysis, starting with nonlinear Hodge theory on a Riemannian manifold. Later, inspired by encounters with Atiyah and Bott at the Institute for Advanced Study, they began to study the Atiyah-Singer index theorem and $K$-theory, sometimes while sunbathing on nude beaches in the south of France. This led to their best-known work, which was on gauge theories, especially Yang-Mills, and which continued until Lesley passed away.

Cliff Taubes writes: “Lesley was one of the mathematical pioneers of Yang-Mills theory. Her theorems with Bob Sibner about removable singularities taught us how holonomy and finite energy play off each other to allow or prohibit singularities. These theorems led to the applications of instantons by Peter Kronheimer and Tom Mrowka to describe knot polynomials and the like. The theorem I envied most was joint with Bob Sibner and Karen Uhlenbeck, which gave a counterexample to the conjecture that all Yang-Mills fields on the 4-sphere were self-dual or anti-self-dual. Even so, I was so much more delighted, because such a good theorem couldn’t have come to nicer people. Lesley and Bob were always so nice to me, and I am sure they probably were to other wet-behind-the-ears youngsters. So sad to see the passing of a good person like Lesley.”

Lesley was not a typical mathematician. Karen Uhlenbeck writes: “I have many memories of Lesley, but my favorite was when I met Lesley and Bob for the first time at a summer school in Trieste. I went to a talk on nonlinear Hodge theory. Lesley got up in a purple suede pantsuit and high heels and proceeded to give an interesting and clear talk. I could not believe my eyes! Being a woman in math took on a completely different meaning. Subsequently, she served as an important, inspiring, and kind mentor to me.”

—Deane Yang
New York University

Okan Gurel (1931–2015)

OKAN GUREL of New York, New York, died on March 14, 2015. Born on August 1, 1931, in Turkey, he received his PhD in applied mechanics from Stanford University in 1961 after receiving his MASc from the University of British Columbia and, before that, his YMüh from Istanbul Technical University in 1954. He was a long-time IBMer working on business-related mathematical problems, such as the marker-layout problem, and on mathematical explanations of phenomena in biology and chemistry, as exemplified by his role as the lead organizer of the New York Academy of Sciences symposium on Bifurcation Theory and Applications in Scientific Disciplines. He was coauthor with Demet Gurel of Oscillations in Chemical Reactions, published by Springer-Verlag in English and by Mir in Russian, with an unauthorized version published by Akademie-Verlag in East Germany.

—Ozan Gurel
New York, New York